JPRS 79974

28 January 1982

East Europe Report

SCIENTIFIC AFFAIRS

No. 730

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LACK OF CEMA COOPERATION IN ELECTRONICS DEPLORED

AU291352 Bratislava PRAVDA in Slovak 28 Dec 81 p 1

[Editorial: "Words Do Not Deepen Integration"]

[Excerpts] The progress being made in introducing electronics into the national economy is slow. This is felt especially by our engineering, which has lost (and, deplorably, continues to lose) more than one position on foreign markets only because the products it offers have a low share of electronics.

The problem lies in the outdated component base, which is no longer commensurate with present needs. Our designs would live up to the present demands were it not for the fact that often we lack the base for the designs. The problem has yet another aspect; some advanced microelectronics components being produced in our country are, because of their price, hardly accessible and excessively burden the production costs--this is what the designers claim. The production sector denies this. Given our broad range of components, it is very difficult to keep abreast of the high pace of innovation [in the world]. Introducing mass production and thereby making it less expensive is another problem.

Is this a vicious circle from which there is no way out? Indeed, but only for those who continue to indulge in the notion that to be up to the world standards means to be able to produce everything single-handed, whatever the cost. Let us ask: Is it within the Czechoslovak economy's capabilities--considering its limited raw material and production potential and, in particular, the fact that electronics has been neglected for many years--to come to terms with the economy's electronicization [elektronizacia]? An answer in the affirmative can only be given when we make broader use than heretofore of the possibilities offered by socialist integration, by production sharing and specialization (as regards both components and individual clusters of components) with CEMA countries and the Soviet Union in particular.

Past experience, when every koruna invested in the CSSR in the development of scientific-technical and production cooperation with the Soviet Union yielded almost KC$8 in final effects (!) should finally open the eyes of the helsmen of our electrotechnical industry. Or is it perhaps possible to doubt the ability of the country that dictates progress to the world in space research, in the use of nuclear technology and in other areas of scientific-technical development to master the technology for the development and production of things such as microelectronics systems or microprocessors?! Is it not a great pity that we are not able to make full use of the vast economic, scientific and production potential of the land of the Soviets (it accounts for up to 70 percent of the CEMA countries' total social product) with its roughly 1.5 million highly qualified experts working in the scientific-research base alone? There are also possibilities for close cooperation with the GDR, which has mastered technological facilities for microelectronics.

To make things clear, cooperation with the fraternal countries is based on mutual benefit and equality. It obliges us, therefore, not only to take but also to give. It would be a mistake to assume that we can pay for assistance in electronics with products of the footwear or glass industries. The partner rightly expects, on the basis of reciprocity, other analogous, technically advanced, top machinery, equipment and technology.

Broadly based cooperation, especially with the USSR, has proved to be highly effective in several areas. The question comes to mind: Would it not be possible to find a similar recipe for cooperation with the USSR and other socialist countries in the electrotechnical industry, in developing the component base, in introducing new technologies as well? It certainly would. One would only have to spend less energy on rhetoric, explanations and excuses and concentrates on deeds. For example, how long has the production sharing and specialization between the two manufacturers of television sets, Tesla Orava and Rubin Lvov, been merely spoken about...?

At the 16th CPCZ Congress and at the Fourth and Fifth CPCZ Central Committee sessions, critical remarks were made about the ministries (including the Federal Ministry of Electrotechnical Industry) and economic production units' lack of initiative in more intensively involving the sector or some factories in socialist integration, even though there is an abundance of suggestions and programs of joint interest. Those criticized may retort and prove with statistical evidence (this camouflaging maneuver is often successful) what a great range of problems they are solving within the international CEMA framework. The snag is that what is being presented as production sharing and specialization with socialist countries is often ordinary trade exchange. The subject of cooperation can also be exchange of knowledge, joint work on documentation and the like. However, what we are interested in is a higher form of cooperation. And precisely electronics is a "field that lies fallow." A field that has not been utilized for complete cooperation with CEMA member countries and the Soviet Union in particular, cooperation that would cover the entire range of the problem from research down to the production of finished goods. Why we have not been successful so far, that should provide our representatives in CEMA agencies with food for thought--representatives in the Standing Commission for Radio-Technical and Electronics Industry, in the Intergovernmental Commission for Computer Technology or in the Intergovernmental Czechoslovak-Soviet Commission for Economic and Scientific-Technical Cooperation, in which there are five permanent work groups in charge of the electrotechnical industry.

CSO: 2402/17

SYSTEM FOR AUTOMATION OF ENGINEERING WORK DESCRIBED

Sofia BULGARIAN FOREIGN TRADE in English No 6, 1981 p 30

[Article by Eng. V. Vlaeva]

[Text]

A system for the automation of engineering work is one of the latest achievements of Bulgarian computer technique. Among experts it has already become known by its Bulgarian initials as SAIT. It solves an important and topical problem in engineering and designing: the processing of graphic data. Its significance can be fully appreciated, when it is borne in mind that engraving makes up over half of the work of engineers and designers.

SAIT is a representative of dialogue and interactive systems, which constitute a new class. In comparison with the classical computer systems, which make use of digits, SAIT is based on the language of engraving. This graphic form of representation is readily perceived by man. The machine does all the routine work and shows its automated solutions on a screen, while the expert by means of a light pen can work on that solution. Man is thus included in the calculation process with his intellect and intuition. The automation of creative work turns into a dialogue 'man-machine'.

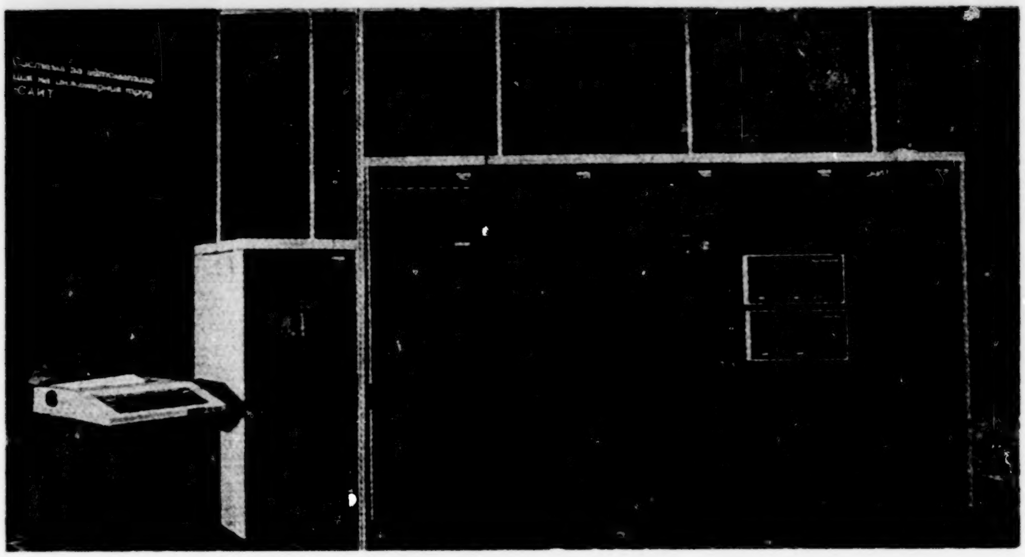
The configuration of this system consists of four autonomous subsystems: a central processor — ISOT-2100 S, with operative memory and a special processor for it, an input-output processor, and a peripheral processor. The subsystems are connected by means of an effective scheme, based on an asynchronous principle of work. Each subsystem permits a further development as regards the number of peripheral devices, thanks to which SAIT's potential — quantity of data and rapidity of processing — can be raised.

SAIT has a ready programme for the designing of plates in electronics, which closes the cycle of designing electronic elements, elaboration of technologies for two-layer and multilayer printed-circuit cards, the construction of elements on them, the drawing of photopatterns for the production of printed-circuit cards, the documentation and technical preparation of production. In all cases we mean the generation of control programmes for special technological machines in electronics with programming. SAIT was used for the first time in order to design itself, its own plates.

This system should facilitate the work of engineers and designers in construction, architecture, machinebuilding and car manufacture. The programming of cutting material in the tailoring and metalworking industry, in shipbuilding and wherever leaf material is subject to figure processing, has already been terminated.

SAIT represents a major contribution to the solution of problems of intellectualization in all spheres of human activity.

Exporter:
ISOTIMPEX
Foreign Trade Organization
Sofia, Bulgaria
51 Chapaev St.
Phone: 73-61
Telex: 022 731, 022 732



CSO: 2020/18

INFOREG PROBLEM-ORIENTED COMPLEX

Sofia BULGARIAN FOREIGN TRADE in English No 6, 1981 pp 30-31

[Text]

Inforeg is the name of the first problem-oriented complex in Bulgaria, based on the technical and programming means of computers of the SM series. Its main purpose is to automate reference data, but it can also be used as a powerful mini-calculator with universal application.

The basic functional part of the problem-oriented complex is the SM 4P processor. The complex conforms to modern requirements as regards configuration of systems. It offers a wide range of possibilities: the maximal outer memory has eight disk devices by 29 MB. Its volume is determined by the package of programmes. The structure of information on a concrete sphere of problems is organized through these programmes.

Up to 48 working places with local and long-distance switching in of the terminals can be organized by means of this complex. The data are introduced by means of a letter-number display. Inforeg performs the addition, storage, topicalization and processing of the data. It is a dialogue system and operates in conditions of time-division and collective access to the data base. As many as 64 programmes can be carried out simultaneously. The information is processed with a precision up to the 27th decimal sign.

The programmer obtains access to the system with the help of a specialized operational system and problem-oriented idiom. His work is facilitated by a set of systematic and official programmes for work with a data base. The system is protected from unauthorized access.

Inforeg can conciderably alleviate the administrative servicing of the population by creating automated card-indexes and registers. It can be used for analogous purposes in hospitals and clinics, where it makes it possible to trace the history of the disease and to rapidly diagnose it. It greatly facilitates reference services in libraries. The list of Inforeg's possible application is a long one, including among others: insurance, administrative work in schools and universities, foreign trade organizations, material and technical supply, and warehouses.

Exporter:
ISOTIMPEX
Foreign Trade Organization
Sofia, 51 Chapaev St.
Phone: 73-61
Telex: 22 721, 22 732

[photo on next page]

CSO: 2020/18

TEXTPROCESSING MACHINE ISOT 1002C DESCRIBED

Sofia BULGARIAN FOREIGN TRADE in English No 6, 1981 p 43

[Text] Automates type-writing and traditional editing operation in typing offices, editorial boards, printing houses. Useful for recording new articles in design and construction institutes and development bases, as well as for setting up modern ways of work in the offices of large industrial or farming enterprises. It is made on the modular principle.

Technical Features

--Control unit on the basis of an 8-bit microprocessor.

--Volume of the operative memory--48K bite.

--Display on electronic-ray pipe (tube) with display capacity of 1920 symbols.

--Standard keyboard in Latin and Cyrillics.

--Functional keyboard on the basis of the traditional language for correction and processing of texts.

--External memory unit on flexible magnetic discs ES50 74.

--Serial letter-digital printing unit ES 7187--el. power.

--Feeding 220V, 50 Hz.

Performance

--Introduction and printing of text on the external memory unit.

--Automatic formating of the text fed.

--Various corrections, inserting, replacing or removing of sentences, words or separate symbols.

--Setting up of document of standard text passages.

--Duplication of documents.

Address: Sofia, 51, Chapaev St.
Tel. 73-61
Telex: 22731, 22732.

CSO: 2020/18

ESK-M-400 AUTOMATIC TELEPHONE EXCHANGE DESCRIBED

Sofia BULGARIAN FOREIGN TRADE in English No 4, 1981 p 30

[Article by Eng. V. Yossifov: "ESK-M-400 Automatic Telephone Exchange With Microprocessor Control"]

[Text]

The ESK-M-400 automatic telephone exchange is designed for office telephone networks with a capacity of up to 400 interior extensions. It is a development of the ESK 400 E office branch exchange of the crosspoint type, an improved new generation of telephone exchanges, quite up to the latest requirements of communication technique.

ESK-M-400 has considerable advantages over its predecessors. It is controlled according to a new schematic solution based on microprocessors, thereby realizing a programming movement of the orders. Control by a recording programme makes it easily adaptable to various signalization systems. Integrated circuits with a high degree of integration have been used, and the model structure introduced makes for a most rational utilization of the equipment with different schedules.

Much more compact in size, the ESK-M-400 exchange has been developed at the Institute of Communication Industry and is produced by the plant for telephony and telegraphy in Sofia. It was awarded a gold medal at the 36th Plovdiv International Fair where it aroused pronounced interest, among experts and businessmen.

Exporter:

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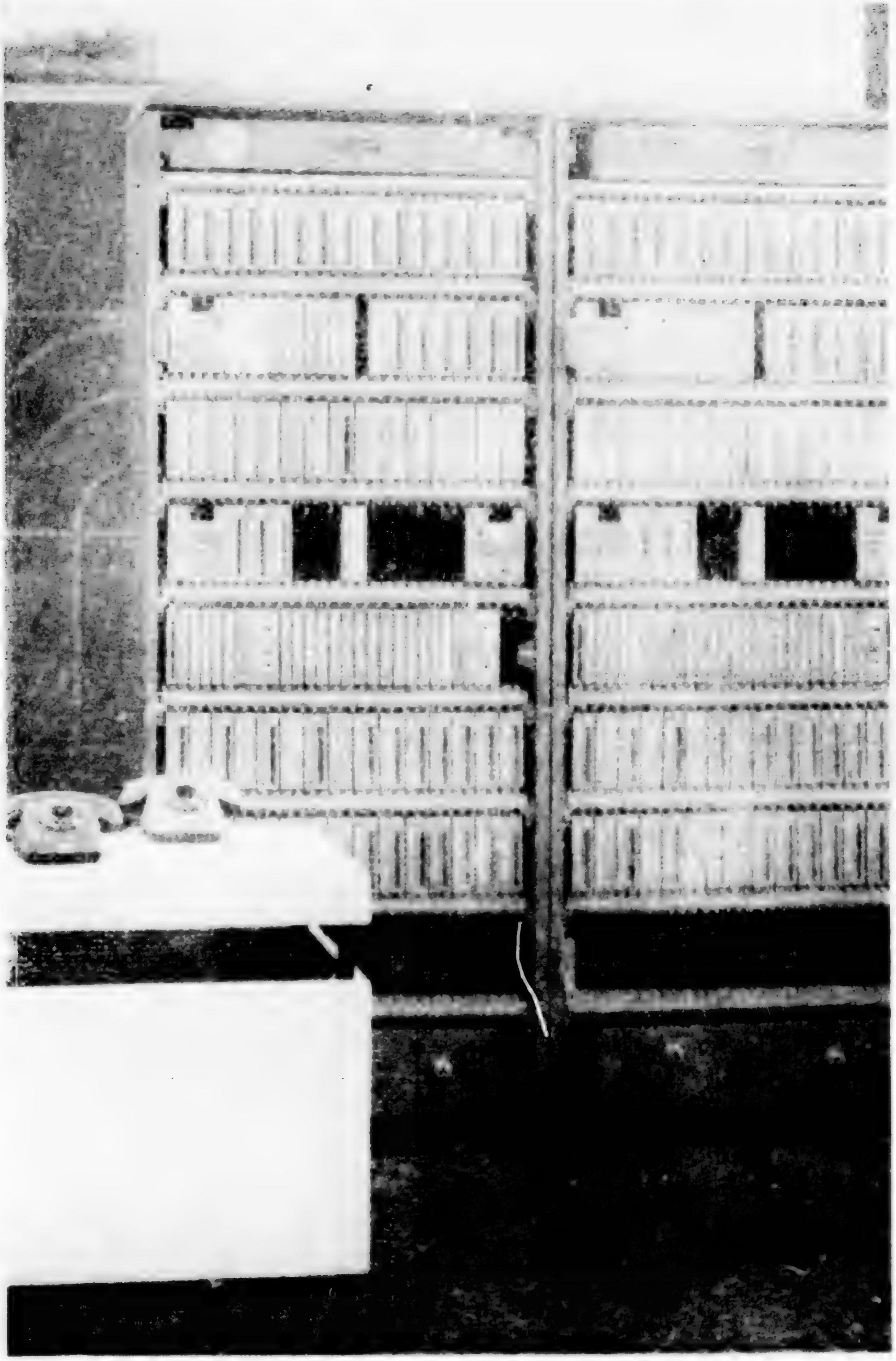
Telex: 022 075



CSO: 2020/18

NEW SERIES OF MEDIUM-WAVE RADIO TRANSMITTERS

Sofia BULGARIAN FOREIGN TRADE in English No 4, 1981 p 31

[Text]

The new SB series of medium-wave radio transmitters was designed in accordance with the latest requirements: higher technical indicators, compact size, maximal reliability in operation and easy servicing.

The SB series of medium-wave radio transmitters have a rated power of carrying frequency of 1, 10, 25, 50, 100, 250 or 500 kW and a frequency range of 525 to 1,605 kHz. They have a module structure, so that they can be rapidly mounted and transported. The application of quite new technical solutions has made it possible to produce one of the most compact radio transmitters in the world as regards of power. The SB series is made entirely of transistor elements and only one powerful end radio-lamp is used. The new, exceedingly reliable method of lattice modulation of the carrying frequency is something quite original; it was patented and realized for the irst time in the world production of radio transmitters.

The aerials have been developed according to a new electric scheme, guaranteeing very good transmission. The automatic regime of work, together with the other advantages, makes it possible to slash costs, as no servicing personnel is necessary. The producer guarantees all the necessary accessories, including assemblage and putting into operation.

Exporter:

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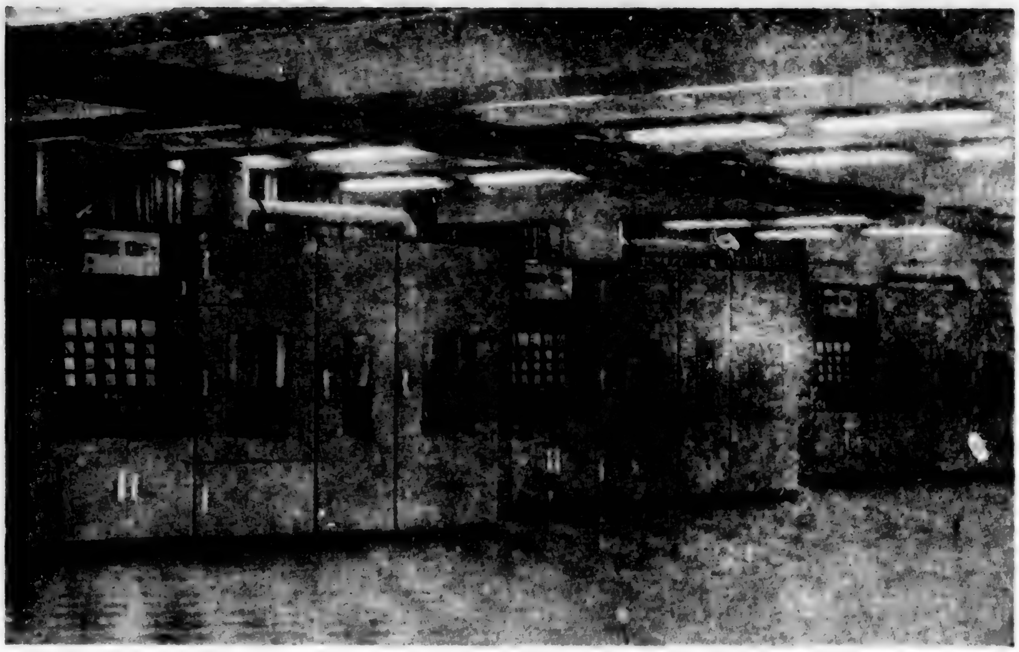
Foreign Trade Organization
Sofia, Bulgaria
17 George Washington St.
Telex: 022 075



CSO: 2020/18

ELKA-90 ELECTRONIC CASH REGISTER

Sofia BULGARIAN FOREIGN TRADE in English No 4, 1981 p 32

[Text]

The ELKA-90 electronic cash register is a cash terminal offering the possibility of automatic introduction of data from labels. It is designed for small, medium-sized and department stores, restaurants, storerooms, etc.

Functional characteristics

Registers:

a) five sectional

b) five cancelling

c) seven for waiters with coding key access

d) one for introduced sums

e) one for sums taken out

f) four for various payments (cash, cheques, credit, coupons)

Each of these registers has a counter (4-digit) for recording the number of accumulations.

g) 76 article registers (8 digits) for introducing a code number

Programmed registers:

a) percentage; b) data; and c) cash number.

Control counters: a four-digit counter for accounts performed, and

b) four-digit counter for cancellations.

Chief operations: accumulation, cancellation, multiplication, % plus, % minus, correction of erroneous accumulation, nullification, total, credit, cheques, coupons.

ELKA-90 has two data-introduction regimes: a manual one and an automatic one by means of a mobile label-reader.

Manual regime: a) introduction of list number up to 11 digits; b) value up to seven digits; and c) quantity up to five digits.

Automatic regime: data are introduced by a manual reader from magnetically coded labels. The maximal number of coded symbols on the label is 45 (list number up to 11 digits, price up to seven digits, additional identification signs (size, height, colour, etc.) up to 24 digits. Data on the article's price and list number which can be visually identified is entered on a paper pad.

Magnetic reader:

a) reading speed: 8÷80 cm/s

b) direction: forward and backward

c) cable length: up to 2 metres

The correctly reproduced signal is indicated by a short sound signal.

ELKA-90 has a cash terminal and two working regimes:

a) autonomous; and

b) systematic, which ensures switching by means of a four-channel interface cable into a digit taperecorder or data-concentrator with orgaganization of circular connection.

Every sale registered on ELKA-90 is accompanied by a slip with data on the price, the article's amount and list number, the cash box number, the type of operation, additional identification signs introduced by the reader on labels and control symbols.

Exporter:
ISOTIMPEX
Foreign Trade Organization
Sofia, Bulgaria
51 Chapaev St.
Phone: 73-61
Telex: 022 731, 022 732

CSO: 2020/18

JOINT USSR, BULGARIAN SYSTEM SHOWN

Sofia BULGARIAN FOREIGN TRADE in English No 5, 1981 p 6

The highly accurate ES 1035 electronic system, a joint design of Bulgarian and Soviet experts.

CSO: 2020/18

BULGARIA

AUTOMATION OF PRODUCTION, ROBOTIZED COMPLEXES

Sofia BULGARIAN FOREIGN TRADE in English No 5, 1981 pp 22-23

[Article by Eng. V. Vuzelov: "Automation of Production Through Manipulators and Robotized Complexes"]

[Text]

The development and production of industrial manipulators and robots, as well as of transport-feeding equipment and systems connected with their application, began in Bulgaria in 1970. In a mere decade the transport-feeding systems which come in various combinations have been finding wide employment in different spheres of industry, especially in engineering. The wide range of robots, manipulators and devices offer good opportunities for devising various technological solutions. Re-attunable automatic lines have been developed, which include processing machines, feeding manipulators of the PIRIN family, roller belt conveyors and other equipment serving a variety of purposes. These lines are used in the machining of semiaxles for electric trucks, graded shafts for metalworking machines and shafts for electric motors. Lines for the mechanical treatment of piston rods of hydrocylinders are made, as well as plungers weighing up to 70 kgf for shafts of telfer electric motors, for shafts and gear wheels of reductors, for rope and chain drums of telfers. The experience gained in the manufacture of these types of robotized complexes and the good technical indicators of the manipulators and transport-feeding devices produced have aroused interest among Machinoexport's foreign trade partners. Automated lines with a re-attunable cycle are being built in the KAMAZ plants in the Soviet Union with Bulgarian manipulators and belt conveyors. Two lines for the treatment of belt conveyor axles are now in operation in the GDR, and others for the treatment of electric motor shafts are now being made. One of them will be used for the complete mechanical treatment of shaft rotors, weighing up to 60 kgf, and the other for the treatment of chuck details up to 250 mm in dia. Similar lines are planned for Poland as well, and Bulgarian standing manipulators are now in use in the ROTA-200 machine system in Czechoslovakia.

Manipulators of the series with a loading capacity of 120 and 160 kgf or so-called 'heavy manipulators' are used in automatic lines or complexes of machines for the manipulation of heavy rotation details such as shafts, rotors and drums. These are stable in structure and come as portal up to 15 m. long. Supports range in number from two to four. The drive is hydraulic and is effected by individual standardized hydroaggregates. The maximal speed of the mobile parts is

0.4 m/sec. and the max. run of the 'hands' is 800 mm. A special modification of this type of manipulators is the model with an electromechanical drive.

Another group of PIRIN manipulators are the so-called 'standing manipulators' of the 521 series. They are placed on a stand so that they can be mounted on the floor of the production premise in front or behind the servicing machine. The details are replaced on these machines by two horizontal mechanical hands located opposite to one another. The design of the hand and the hydrodrive have been standardized to a considerable degree with those of portal manipulators. Depending on the number and sequence of the movements performed, these manipulators come in four modifications, the number of the degrees of freedom of the mechanical hands attaining five. The time required for re-attunement is five minutes. This makes it possible to apply them effectively when servicing machines with digit programming. The replacement of the details takes from 8 to 14 seconds. The load capacity of each hand at a maximal speed of the different movements is 20 kgf payload. Manipulators of this family are in batch production in Bulgaria and are used chiefly in the ROTA F-200 machine systems made in the German Democratic Republic; they are also used, however, in the automation of different working places or production cells.

Bracket manipulators are a modification of portal manipulators. In them the feeding and the unloading hands are located on one side of the carrier beam.

Besides the manipulators listed above, MACHINOEXPORT is in a position to supply its partners with industrial robots for different types of other technological processes: coating, stamping, forging and welding. Among these, let us mention the BEROE-210 spraying model for coating and the industrial robots RB-231, RB-232, RB-233, RB-234 and FB, made after a licence of the American Versatran Co. These, too, are based on the module principle with separate movements; depending on the particular requirements, they come in different spatial positions: supporting, suspended or portal with possibilities of being entirely shifted to the manipulating block. The working organs have a specific configuration, depending on the functional purpose they are to serve. All the movements are with individual servo- or mechanical control.

The experience gained in the designing, manufacture and delivery of automated robotized complexes and the wide range of products (manipulators, robots and complementary peripheral devices) enable MACHINOEXPORT to offer everyone of its customers the technologically and economically best solution of problems involving robotization and flexible automation.

Widely applied in machinebuilding are the Beroe robots of the RB series as well as the different varieties of manipulators ▶

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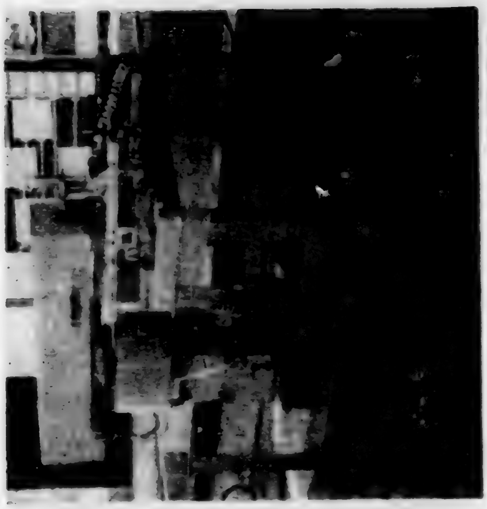
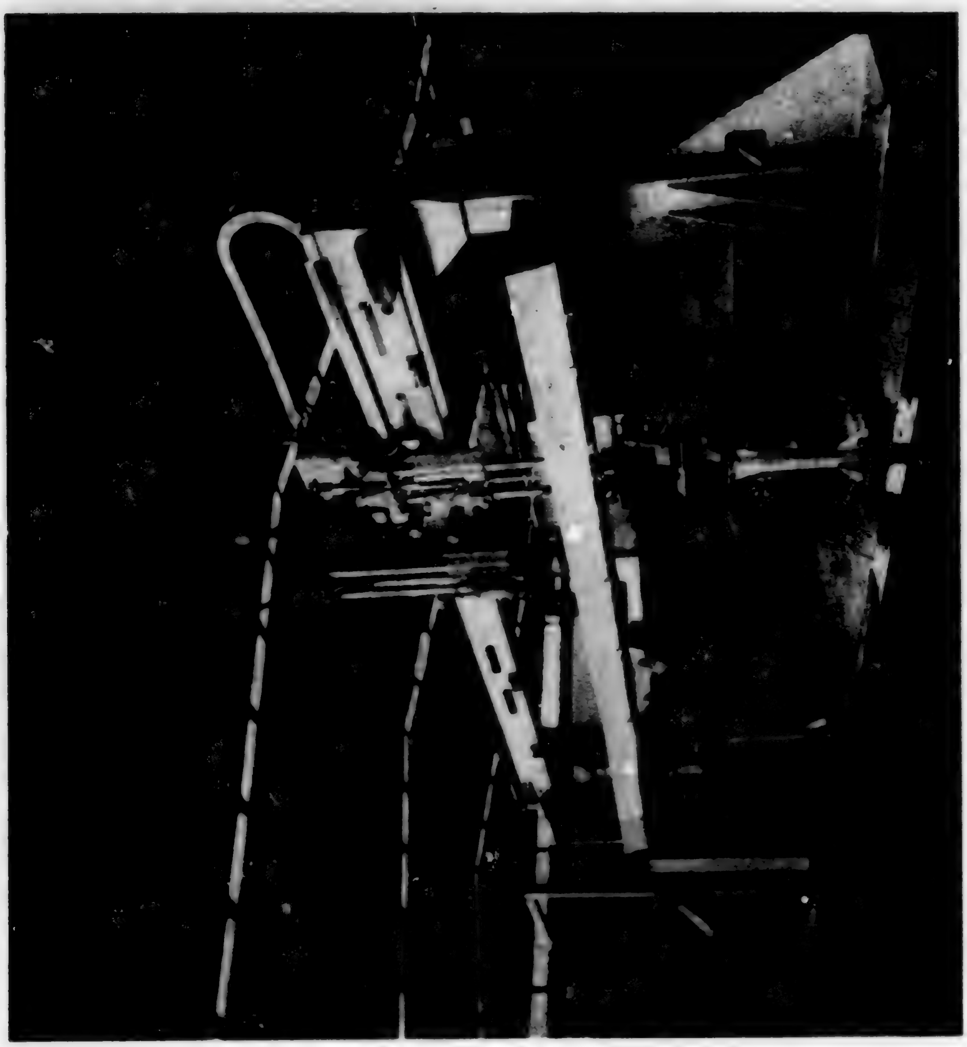


Address:
MACHINOEXPORT
Sofia, 5 Aksakov St.
Phone: 88-53-51



CSO: 2020/18

'RUDE PRAVO' ON DEFICIENCIES IN COMPUTER POLICY

AU221502 Prague RUDE PRAVO in Czech 21 Dec 81 p 5

[Article by Eng Jindrich Katscher from the "Computer and Organization Service" Enterprise in Prague: "Less Would Mean More; the Experience and Views of a Computer Technology User"]

[Excerpts] Jan Obrhel, director of the "Office Machinery Enterprise" in Prague recently drew attention in the press to several serious shortcomings in the use of computer technology--particularly to the fact that we are using various types of computers that are not mutually compatible, that the means invested in computer technology have not found the appropriate valorization [zhodnoceni] in the international division of labor, and that our enterprises' production of computer technology is commensurate neither with the domestic nor with the export needs. J. Obrhel sees the reason for this in the fact that the planning authorities give preference, as far as this type of merchandise is concerned, to quantity over quality. He correctly notes that a smaller number of well-functioning computers would contribute more to the national economy than a large number of inadequately working and incomplete installations.

The causes of this state of affairs are historical and originate in ill-considered innovation drives, in the underestimation of the importance of production traditions, in insufficient cooperation--bordering on rivalry--between research, development, production, service and user organizations, and so forth.

The advent of international cooperation, characterized by a gradual implementation of the United System of Electronic Computers (JSEP), has produced another shortcoming. In the absolutely poorly-thought-out attempt to inplant as much labor as possible into a minimum of material, we have been gradually getting rid of the production of peripheral equipment such as magnetic tape and disk memories, equipment for preparing and collecting data, and so forth. When we today produce such equipment at all, the production is not large enough to effect even the most essential exports, let alone to cover domestic needs. We have reduced the computer technology production sector virtually to the production of processors, that is to the computers' central units. While doing so we did not consider that processors without peripheral equipment and materials enabling operation are incapable of proper functioning.

Because the production start-up of the JSEP computers has been delayed and the import from capitalist countries limited, many enterprises began--without coordinating their activities--to develop or produce various types of fundamentally diverse processors. One could list types such as EC1025, EC1027, ADT 4300, ADT 4500, RPP 16, JPR-6, JPR-12, TP 8, KA 10, SM3-20, SM4-20, SM50/40, SM 50/50 and others. The production or supply of a sufficient quantity of peripheral equipment has been ensured for none of these processors. Every producer is trying to obtain this equipment by limiting or discontinuing the production of other types. Moreover, virtually none of these processors can be exported in large series because almost every CEMA country has access to equivalent or even better types of processors and peripheral equipment from its own production.

The greatest claim for priority allocation of peripheral equipment is currently being voiced by the producers of the SM3-20 and SM4-20 processors. Even though these have been included in the CEMA countries' System of Small Electronic Computers (SMEPO, I do not think that this claim is acceptable. The types concerned are, in fact, transitory models which--even though their production is only starting--should be withdrawn from production in the course of the seventh 5-year plan [by 1985]. They will be replaced by SM50/40 and SM 50/50 minicomputers, based on domestically produced microprocessors.

In my opinion, it would be highly expedient and economical to halt the development and production of the SM3-20 and SM4-20 processors. The resources and manpower thus released could then be concentrated on ensuring the development and production of the SM 50/40 and SM 50/50 computers, including modern peripheral equipment and problem-oriented program modules.

I agree with J. Obrhel's view that it is not expedient when the user organizations ensure the computers' maintenance. This service should be ensured by the National Organization of Technical Maintenance (NOTO). Nevertheless, here, too, it is necessary to carefully weigh one's approach.

First of all, the user must be certain that the operation of the computer system he entrusts to the care of the service organization will be reliable. So far, he does not have this certainty. Computers of the JSEP, SMEP and other systems require constant technical and operational supervision, an air-conditioned environment and an extensive team of programmers and operators.

As far as foreign computers are concerned, the situation is different. They can work anywhere in an office environment and the user can program, operate and maintain his computer himself, with the help of well-organized service organizations. These service organizations monitor and test the operational readiness of the equipment and programs under their supervision from their headquarters, by means of telephone lines. The technician appears in person only when telephone instructions are not enough or when the breakdown is of a more serious nature.

It would be commendable to ensure similar operational conditions for computers in the CSSR. Because the path toward achieving this goal is still long, it should be enshrined in the branches' and sectors' long-term concepts.

CSO: 2402/18

ELECTRONICS INDUSTRY CENTRALIZED, STREAMLINED

Budapest NEPSZABADSAG in Hungarian 5 Jan 81 p 5

[Excerpts] Last December, the Council of Ministers enacted a resolution on the central development program for electronic parts and components. This long-awaited, important decision specifies the main agenda and the areas of development for the next 10 years.

Although the domestic electronics industry has valuable traditions, it has fallen behind the European state of the art over the past decades. Less than necessary has been spent on expanding production of electronic parts; consequently, closing the gap has become vital for industry and the entire economy. Those who prepared the recently accepted program began with the premise that we are not as badly off as many believe in regard to the production and metering equipment needed for fabricating microelectronic parts. A good deal of such equipment can be found at various research institutes and what is lacking can be obtained from the USSR and the socialist countries. The electronics industry is exceptionally developed in the Soviet Union and capable of producing practically anything made by the West. Taking over Soviet technology, adapting their equipment will undoubtedly require much study, preparation and research-development. However, Hungarian engineers have acquired this expertise over the past years and learned what is necessary to fabricate LSIs [Large Scale Integrated Circuits].

In 1976 two Academy research institutes and two industrial enterprises, collaborating with United Incandescent, formed an association for IC research and development. Nearly 600 million forints were spent on specialized training and the evolution of new devices and procedures. Six types of LSIs were developed and their trial production begun. Several new solutions were found and production devices were designed including a microelectronics metering automat.

Up to the present, the leading experts have been working under the direction of several portfolios and in accord with the ideas and needs of various enterprises. Under the program now adopted, specialists from the HIKI [Communications Engineering Industrial Research Institute], the Central Physics Research Institute, United Incandescent, TAKI [Telecommunications Research Institute], the Technical Physics Research Institute and SZTAKI [Computer Technology and Automation Research Institute of the Hungarian Academy of Sciences] will all work under single direction. The technological equipment will be moved to HIKI where there is space and room for expansion.

Insofar as what to produce is concerned, it has been decided to establish design systems and satisfy Hungary's special requirements. Cheap, mass-produced circuits will be purchased abroad. This decision was arrived at after the Communications Engineering Association ordered special, so-called equipment-oriented, circuits from the USA. Such circuits have to be individually designed for the equipment and are capable of performing exceptionally complex tasks. The first 200 such circuits cost 80,000 dollars; each additional circuit was offered for 5 dollars. According to the members of the Association, this proves that the intellectual input is very highly paid for in the field of microcircuitry. From this the Association concluded that we, whose intellectual expertise greatly surpasses the capabilities of our background industry, should not expect profits from serially produced 5 dollar circuits but from those equivalent to the first 200 which cost 80,000 dollars. It is preferable for us to produce fewer but far more valuable circuitry for our own enterprises which make electronic equipment and for our foreign business partners. Our concept links fabrication of electronic components to manufacture of production equipment. Consequently our central development program for electronic parts and components will be based on achievements of the Soviet Union and the socialist countries and our intellectrual resources will be united. To achieve this, we are establishing an autonomous unit to be named the Microelectronics Enterprise. During the 10 years projected for implementing the program the structure for parts and component production will be entirely reorganized to make our production of electronic apparatus more competitive. Preliminary calculations indicate that implementation of the program and reorganization can be achieved for less than the 6 billion forints estimated in previous studies.

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BRIEFS

MERGER OF COMPUTER OUTFITS--As of January 1982 three computer technology organizations were merged into a single, complex development type enterprise. The action was based on the position taken by the Science Policy Committee and the decision of the Central Statistical Bureau. To be known as SZAMALK [Szamitastechnika Alkalmazasi Vallalat, Computer Technology Applications Enterprise] the enterprise will incorporate SZAMKI [Szamitastechnika Alkalmazasi Kutato Intezet, Computer Technology Applications Research Institute], OSZV [Orszagos Szamitogeptechnikai Vallalat, National Computer Technology Enterprise] and SZAMOK [Szamitastechnikai Oktato Kozpont, Computer Technology Training Center] all of which have been disbanded. Establishment of the new enterprise will concentrate forces, promote implementation of the central development program for computer technology and improve the efficiency for R & D. SZAMALK will be located in four buildings in various parts of Budapest. The Managing Directorate will be located at 68 Arpad Szakasits Rd, the R & D Directorate at 30-32 Csalogany Street, the Service and Commercial Directorate at 6 Vahot Street and 104 Bela Bartok Street. [Budapest MAGYAR NEMZET in Hungarian 4 Jan 82 p 3]

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